entire treated length, it is possible to determine their spatial localizations. Thus, it is possible to adapt the scan lengths. On the other hand, to provide education, therapists can easily see the impact of their choices, eg set-up compromises.

EP-1797

Pelvic lymph node PTV margins in prostate IMRT

L. Duvergé[1], J. Castelli[1,2,3], S. Cadet[4], A. Simon[2,3], N. Jaksic[1], C. Lafond[1,2,3], P. Haigron[2,3], R. De Crevoisier[1,2,3]
[1]*Centre Eugene Marquis, Radiotherapy, Rennes, France*
[2]*INSERM, U 1099, Rennes, France*
[3]*University Rennes 1, LTSI, Rennes, France*
[4]*Therenva, Therenva, Rennes, France*

Purpose or Objective: Very few data are available on the intrapelvic motion of pelvic lymph nodes (LN), likely associated with the linked pelvic vessels. The objectives of the study were to quantify the interfraction pelvic vessel motion and to deduce therefore rational PTV margins around the LN CTV, in a scenario of pelvic bone based prostate IGRT.

Material and Methods: The planning CT scans (CT0) and 7 per-treatment weekly CT scans of 20 patients having received IMRT for prostate cancer were used. The main pelvic vessels were manually delineated: common iliac (CI), external iliac (EI) and internal iliac (II) of both sides. The central lines of the vessels were first defined thanks to a 3D workstation (EndoSize®, Therenva) dedicated to the preoperative sizing before endovascular interventions. A pelvic bone registration was then performed. For a given vascular segment, the distance between its central line CL0 from CT0 and its central line CLi from the weekly CTs were calculated.The central line CL0 of each vascular segment was sampled every mm. The distance corresponded to the mean value of the distances between corresponding points of the two central lines (CL0 and CLi). The correspondance was established by considering the cross-section plane othogonal to CL0 at a given point and its intersection with CLi. For each patient, the mean and the standard deviation (SD) of the measurements of the 7 fractions were determined. The systematic error (∑) of the whole population was calculated as the SD of the mean values. The random error (σ) of the whole population was calculated as the root mean square of the standard deviation values. The margins were calculated both with M. Van Herk formula (*IJROBP* 2000) and by geometrically computing margins covering 99% of the vessels displacements.

Results: The results are given for the first 10 patients. The mean (range) lengths (in mm) for IC, EI and II were 47 (18-84), 95 (78-120) and 38 (20-55), respectively. The systematic and random errors and the corresponding margins are given in the Table.

		Common Iliac	External Iliac	Internal Iliac
Ant/post	Systematic Error (∑)	1.3	0.9	1.0
	Random Error (σ)	1.2	0.8	0.7
	Van Herk Margins	4.1	2.8	3.1
	99% Margins	5.1	4.3	4.6
Lateral	Systematic Error (∑)	0.8	0.5	0.9
	Random Error (σ)	0.7	0.6	1.0
	Van Herk Margins	2.6	1.8	2.9
	99% Margins	3.6	2.7	4.0
Sup/Inf	Systematic Error (∑)	0.7	0.7	1.7
	Random Error (σ)	0.7	0.7	1.6
	Van Herk Margins	2.2	2.3	5.2
	99% Margins	2.5	2.9	5.1

Table: Vessels displacements (systematic and random errors) and corresponding PTV margins (according to Van Herk formula and covering 99% of the displacements) around the LN CTV (in mm)

Conclusion: Pelvic LN PTV margins should be around 5 mm for the common and internal iliac CTV and 4 mm for the external iliac CTV.

EP-1798

Is there a true dosimetric improvement in lung SBRT using a 6-Degree of Freedom couch in IGRT era?

S. Menna[1], S. Chiesa[2], A.R. Alitto[2], L. Azario[1], G.C. Mattiucci[2], S. Teodoli[1], N. Dinapoli[2], L. De Filippo[2], M. Balducci[2], V. Valentini[2]
[1]*Università Cattolica del Sacro Cuore, Physics Institute & Operative Unit of Medical Physics, Rome, Italy*
[2]*Università Cattolica del Sacro Cuore, Radiation Oncology Department- Gemelli-ART, Rome, Italy*

Purpose or Objective: To investigate dosimetric impact of rotational errors on Stereotactic Body Radiation Therapy(SBRT),using Protura 6-Degree of Freedom(6-DoF)Robotic Patient Positioning System(CIVCO Medical Solution).

Material and Methods: Patients enrollment included:lung primary or metastatic tumors,maximum 3 lesions,preferably not in central position and until 5 cm.The target should be clearly evident at staging imaging.PTV was obtained adding 0.3 cm as margins to target(CTV).A kV-Cone Beam CT(kV-CBCT)was acquired before dose delivery.After 3D manual match,translational and rotational shifts were applied by the Protura Couch.Using MIM 5.5.2 software,a CT was generated by rigid registration in the CBCT wrong position,i.e. patient position at the moment of CBCT.Then,translational shifts were applied,obtaining a translated CT(tCT),i.e. CT in wrong position with only translational errors correction.Then,rotational errors were corrected too,obtaining roto-translated CT(rtCT).Initial treatment plan was copied to translated CT(tTP)and roto-translated CT(rtTP).Finally, dosimetric parameters were compared.

Results: From July to September 2015,13 patients were enrolled(10 with primary tumours and 3 with metastatic lesions;9 peripheral and 4 central lesions;mean volume 13,26 cc)with a median age of 74 yrs(range 58-86);52 CBCT studies,52 tTP and 52 rtTP were performed.No correlation was observed between magnitude of translational and rotational shifts.Dosimetric evaluation showed no important variations in CTV V95% for rotations(mean±SD 0.00±0.05).Ninety-one percent (91%)of all PTV V95% was≥ 95% in roto-translated plans;in the worst case a mean rotation of -0.3° caused a decreasing in V95%=93%.Small differences due to rotations were found in all Organs at Risk(OAR)matrices reported in Table 1.

	Spinal Cord Dmax (Gy)	Heart Dmax (Gy)	Esophagus Dmax (Gy)	Total Lung V(%) 20	Total Lung V(%) 12.5	Total Lung V(%)5
MEAN	0,0	0,0	0,0	0,0	0,0	0,0
SD	0,3	0,8	0,2	0,0	0,0	0,2
MAX	0,8	4,2	0,5	0,1	0,1	0,4
MIN	-0,8	-3,0	-0,3	-0,1	-0,1	-0,6

After rotational corrections,an improvement was observed in constraints values for OARs than reference planning dose(Table 2),although only 3% of all data had an improvement>5%.

Spinal Cord Dmax (Gy)	Heart Dmax (Gy)	Esophagus Dmax (Gy)	Total Lung V(%) 20	Total Lung V(%) 12.5	Total Lung V(%)5
37,8%	31,1%	28,9%	48,9%	57,8%	42,2%

Multiple regression and pairwise confront(post-hoc test)showed significative linear correlations between esophagus Dmax and roll(p=0.007) and pitch(p=0.020)rotation,total lung V12.5 and yaw(p=0.048).Regarding PTV coverage,V95% and V105%,no significant difference between tTP and rtTP was observed(Mann-Whitney test p>0.05).

Conclusion: These preliminary data show an improvement for OARs if rotational shifts are applied.Dosimetric benefits on lung tumours are small that is PTV margins are optimal for all shifts detected.Dosimetric evaluation in other sites is ongoing.